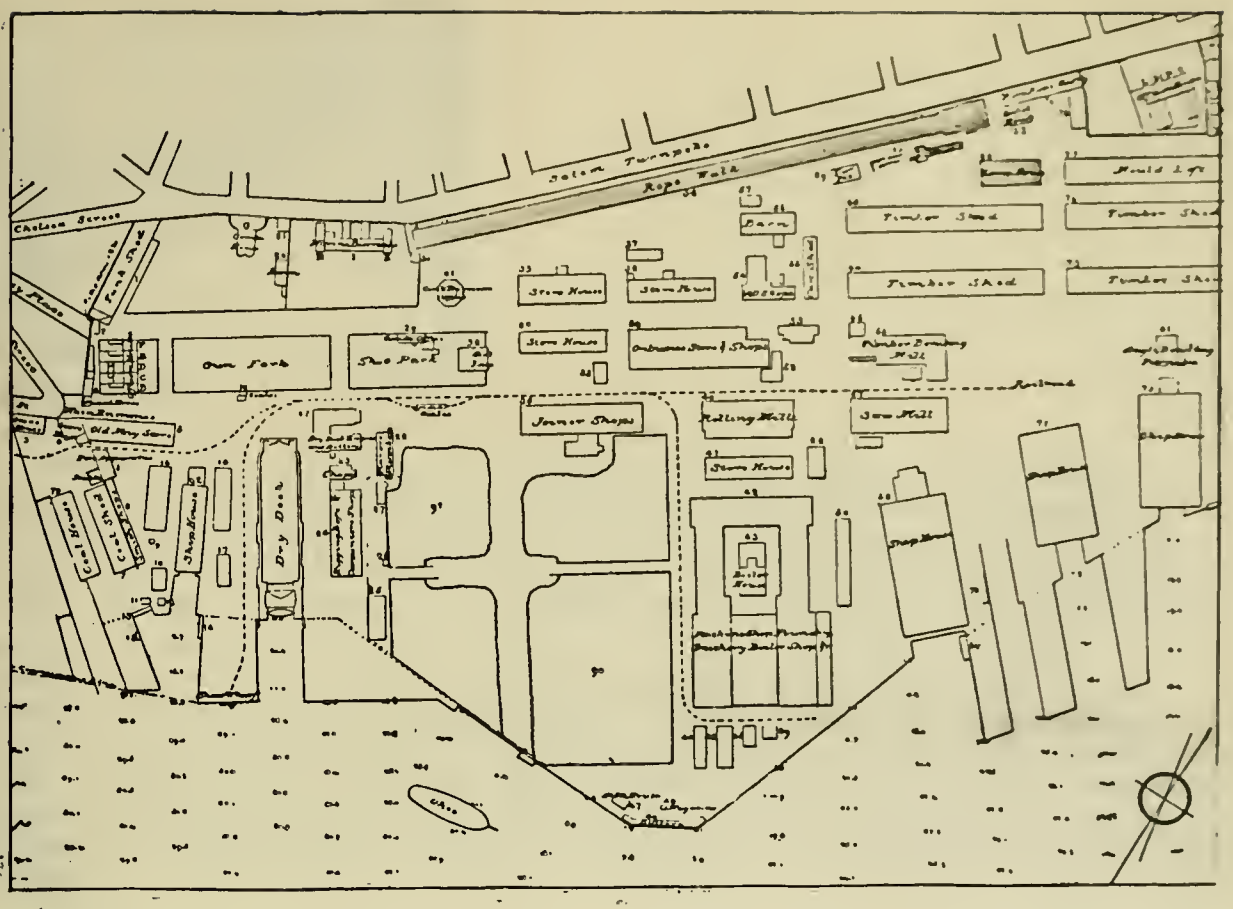
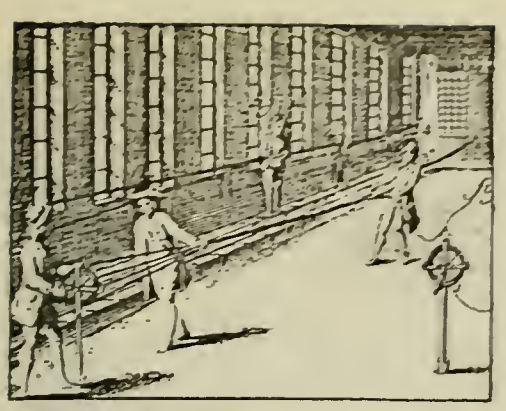
THE ROPE WALK in the Charlestown Navy Yard

Boston Redevelopment Authority
Robert T. Kenney, Director
1974



SUMMARY

Built in 1834-1837, the Rope Walk at the Charlestown Navy Yard produced all of the rope used by the U.S. Navy for more than 100 years, and was an integral part of the shipbuilding and maintenance activities of the Yard. The unique granite structure, which extends 1360 feet, was designed by Alexander Parris in the Greek Revival style and incorporated the latest in ropemaking machinery of the time. It is now the only surviving stone ropewalk in the United States and represents an important facet of the history of the Navy Yard itself and of the Naval history of the nation.



"WALKING" ROPE

The manufacturing of cordage involved three steps: spinning the fibers, tarring them for weatherproofing, and laying them out to dry. Although all of these were eventually performed in a structure called a "ropewalk," the name was derived from the spinning process when the fibers were literally walked through the length of a structure and simultaneously twisted together.

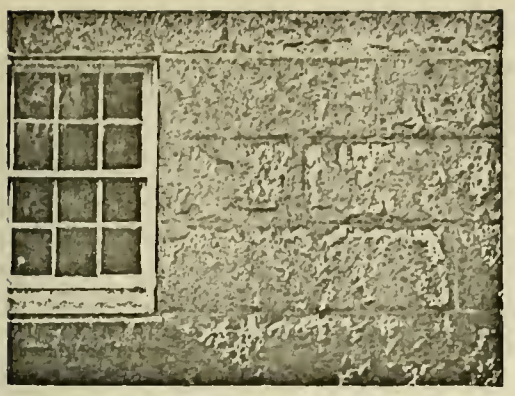
During the early Colonial settlement, a ropewalk was simply a long, usually flat field with rows of pegged posts on which the strands of rope were placed after they had been "walked" or spun. The uncertainty of New England weather prompted the construction of long, wooden, square windowed sheds to protect the ropewalks, and the name which derived from the original process was carried over to identify the structure. By 1794 there were 14 ropewalks in Boston alone and by 1810 there were 173 ropewalks in the United States.

THE NAVY NEEDS A ROPEWALK

Since the major activity of the Charlestown Navy Yard was the building and repairing of ships, it is not surprising that high quality cordage was a necessary ingredient to the efficiency and reputation of the yard. Every ship needed several heavy rope cables. For example, frigates like the U.S.S. Constitution required seven cables 21 inches in circumference, just to serve as anchor cables. In addition, the early sailing ships had extensive rigging, sometimes running 600 feet in length.

In 1833, thirty years after the establishment of the Navy Yard, the suggestion was made that the U.S. Government manufacture its own rope rather than purchase it from commercial sources. Jesse Elliott, Commandant of the Boston Naval Yard, in a persuasive letter to Secretary of the Navy, Levi Woodbury, pointed out the advantages of good cordage for safety and security and also emphasized the economic benefits forthcoming from such an arrangement.

After a year of exploring construction costs as well as the costs of the newest rope spinning machinery, approval for a ropewalk to be built at the Charlestown Navy Yard was finally given by President Andrew Jackson.



STONE VS. WOOD

Owing to the use of highly flammable tar as a weather protective treatment for the rope, wooden ropewalks frequently burned down, threatening nearby structures and causing selectmen to call for their relocation to the country. In 1819, after three great fires in Boston, private ropemaking operations were rebuilt inland, in sparsely settled areas--but still using wood as the principal building material.

While wood construction for ropewalks had obvious disadvantages in terms of fire hazard, masonry construction was considerably more costly. So the Navy's decision to construct a ropewalk of masonry--stone or brick--represents not only an intention to remedy defects in the existing process, but also the capability of the government to allocate sufficient funds for the project. The total expenditures for the building and machinery were $163,000: $50,000 appropriated initially in 1834; another $50,000 appropriated in 1835; and $63,000 requested in 1836 to complete the effort.

Even more important than the Navy's role in accepting masonry as a suitable building material for a ropewalk was the role of the architect, Alexander Parris. It was he who specified granite and determined the total design of the structure.

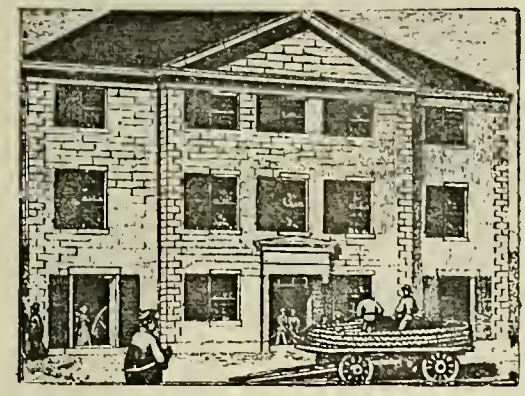
ALEXANDER PARRIS (1780-1852), ARCHITECT OF THE ROPE WALK

Alexander Parris's reputation as a major architect had been well established by the time he designed The Rope Walk. He had designed residences for prominent New Englanders, including the David Sears' House (the present Somerset Club on Beacon Street, 1816), but he had achieved greatest recognition for St.

Paul's Cathedral on Tremont Street (1819-20) and the Faneuil Hall Markets (1824-1826).

His involvement in the Navy Yard corresponds with the years in which the greatest building activity in the Yard occurred, between 1828 and 1850. This era also signified the most active period of shipbuilding and was a period when building construction followed an order imposed by a specific site plan in 1828. A majority of the structures built during that period were constructed in granite and involved the hand of Parris. In particular, his work on Dry Dock I (1827-1833), with master engineer Loammi Baldwin, was of exceptional interest to Parris, because he had always been fascinated with the engineering and functional aspects of construction as well as the aesthetic considerations.

Parris's choice of granite as a building material reflects a significant change in the style of 19th century Boston architecture and is related to the availability of the stone itself. Before 1800, the use of granite was limited to decorative or minor structural features since there was only a limited supply. It was only through Gridley Bryant's opening of the Quincy Quarries in 1826 and his development of innovative engineering devices that large slabs of granite could be more easily assembled and conveyed. The resultant accessibility of granite provided architects with a suitable building material to express the monumentality of esteemed classical Greek structures. Parris formed the heavy granite blocks into temple type structures with an architectural expertise that led others to follow. This architectural movement which Parris helped to create is called the Greek Revival style.



THE ARCHITECTURE OF THE ROPE WALK

The Rope Walk is a long, low structure 1360 feet long and only 45 feet wide, with a three-story "Head House" eventually used for steam powered engines at the eastern end. The impressive length and architectural design of the building combine to create a simple yet powerful impression.

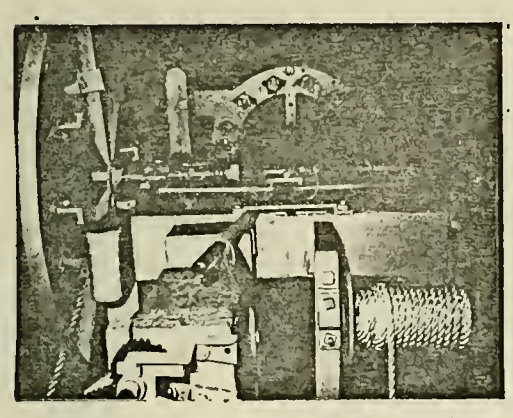
Its Greek Revival style exemplifies mid-19th century architectural taste, and conveys the order, respect and dignity associated with the first classical democracy. The building is symmetrical and austere with a basically undecorated facade, which symbolizes classical restraint. The outstanding feature of the facade is the granite itself. These rough textured granite blocks are interrupted only by the windows and the entrance of the building which consists of a broad, smooth granite band, known as an architrave, resting on attached columns, known as pilasters. The only other distinctive feature is the quoins, smooth granite blocks used at the corners of the building to outline the facade.

The interior construction of the Head House is based on cast iron "I" beams with alternating segmental brick vaults, a system probably employed to prevent fire. For the main portion of the building, the "walk", however, Parris used the cheaper, more conventional solution of timber trusses.

LOCATION IN THE YARD

The Navy Yard's site plan of 1828 unified the Yard by combining an interior rectilinear grid pattern with the original street layout. The specific siting of the Rope Walk followed the property line of the shipyard as it abutted Chelsea Street, which was at a slight angle to the grid. The placement of the Rope Walk clearly defined the Yard boundary by forming a massive horizontal granite edge along Chelsea Street. The effect was a powerful barrier without interference with the existing access gates. Two subsequent structures, the Tarring House (1838) and the Hemp House (1838) conformed to the angle set by the Rope Walk and produced a sensible circulation pattern.

Not only did the arrangement of the three buildings (Rope Walk, Tarring House, Hemp House) facilitate the ropemaking process, it also inadvertantly served a recreational purpose. An informal path was created between the Rope Walk and Tarring House that eventually extended along the eastern length of the Rope Walk. It was considered one of the most inviting walks in the Yard. According to shipyard chroniclers, it was known as "Flirtation Walk" because of its popularity on moonlit evenings.



THE ROPE WALK AS A MANUFACTURING PLANT

The Rope Walk is a prime example of the "form follows function" concept. The main portion of the building was the "walk", originally only one story; except for a small two-story segment adjacent to the Head House. In the main section the fibers were "walked" through the length of the structure by machines, which had begun to replace manpower by the 1830's. All mechanical power came from steam driven engines placed in the Head House, a three story section at the eastern end of the walk. This section also held a machine repair shop, oiling room, overseer's office, and an all-purpose space in the central area.

The Rope Walk was designed to work efficiently as a unit and in relation to the other aspects of the ropemaking procedure, which occurred in two support buildings, the Hemp House and the Tarring House. The manufacturing process started with raw hemp, which was stored in the Hemp House. It was then moved through a metal bridge to the Tarring House, where it was coated

with tar preservatives, and then transported on another bridge to the Rope Walk. In the Rope Walk the single yarns were formed into multiple strands and finally formed into ropes.

The operations performed in the Rope Walk were conducted in stages on separate but parallel machines which used the entire length of the building. First, the yarns were twisted (called "forming") into strands by an open railroad hand car moving backward on rails which ran the length or "walk" of the building, pulling and twisting as it moved. Then these twisted strands were laid into rope by another twisting operation which braided the strands, performed by a similar railcar and similar operation. In this manner the rope was built up to a multi-layered unit by a method of opposing twists.

The special machinery for the spinning and twisting procedures was considered quite impressive, having just been invented by Daniel Treadwell of Boston between the years 1828-1834.

ALTERATIONS TO THE ROPE WALK

Additions to the Rope Walk in 1856 and 1908 for greater productivity extended the original small second story by 848 feet, and a three-story wooden addition was constructed at the opposite end of the Head House shortly before World War II. The first two additions matched the original form and granite material.

Although the equipment was updated periodically, some of the Treadwell machinery remained throughout the years.

The scarcity of hemp during World War II stimulated the testing of synthetic fibers, and by the 1950's the change to synthetic production was fully accepted. The Rope Walk continued to manufacture 20 percent of the Navy's rope and allied products at a cost benefit until the 1960's, when pressure from private ropemakers forced government re-evaluation of the efficiency of producing its own rope. As a result, activities in the Rope Walk were terminated in 1971. That the Rope Walk remained a functional structure for 134 years with only minor alterations is a significant tribute to its designer, Alexander Parris.

Annotated Bibliography

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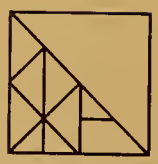
PHYSICAL CHARACTERISTICS - ROPE WALK

AND ASSOCIATED STRUCTURES

	Rope Walk Bldg. 58	Tarring House Bldg. 60	Hemp House Bldg. 62
Type Construction	concrete footings stone & wood walls	concrete footings stone walls	concrete footings stone & brick walls
Floor Area:			
first	66,672 sq. ft.	4,669 sq. ft.	17,191 sq. ft.
second	56,722 sq. ft.	4,288 sq. ft.	17,087 sq. ft.
third	17,100 sq. ft.	--	--
	140,494 Total	8,957 Total	34,278 Total
Allowable Live Floor Loads:			
first	97 lbs. per s. f.	480 lbs. per s. f. on soil	
second	100 lbs. per sq. ft.	-	250 lbs. per sq. ft.
third	50 lbs. per sq. ft.	-	-
Misc. Information:	Building is 1360 ft. long 1 freight elevator Basement & Attic entrances limited	-	1 freight elevator
Most Recent Use:	Rope Walk, Administrative Apprentice school	-	Rope Walk and test laboratory



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